FNIRSI 菲尼瑞斯

FNIRSI-S1

# 大屏数显智能万用表
# 使用说明书

## DIGITAL MULTIMETER INSTRUCTION MANUAL



# CATALOG

## NOTICE TO USER

- Please read this instruction manual and operation instructions carefully,Follow the instructions in the manual,In order to make the detector function fully.
- Please keep this manual.
- Dont use this equipment in a flammable and explosive environment.
- Replaced used batteries and discarded instruments cannot be disposed of with household waste.Please handle according to relevant national or local laws.
- When there are any quality problems with the instrument or questions about using the instrument.You can contact "FNIRSI" online customer servic.

## 1.INTRODUCTION

This product is a handheld large-screen digital display smart multimeter. It has the advantages of fast measurement data, large-screen LCD dual display, lighting, and easy reading by users. It has functions such as overload protection and battery undervoltage indication. Whether it is used by professionals, factories, schools, hobbyists or families, it is a rational think of the multi-function instrument. The overvoltage standard is CAT III 1000V.

## 2.SAFETY INSTRUCTIONS

When using this instrument, the user must follow all standard safety procedures regarding:

1.Safety regulations to prevent electric shock

2.To ensure your personal safety, use the test pens provided with the meter. Before use, check and make sure they are in good condition.

## 1.SAFETY PRECAUTIONS

●Use the meter near the equipment with large electromagnetic interference, the reading of the meter will be unstable, and even may produce larger errors.

●Do not use when the appearance of the meter or test leads is damaged.

●If the instrument is not used correctly, the safety function provided by the instrument may be invalid.

● Extreme care must be taken when working around exposed conductors or busses.

●It is forbidden to use this instrument near explosive gas, steam or dust.

●The correct input terminal, function and range must be used for measurement. The input value must not exceed the input limit value specified in each range to prevent damage to the instrument.

●When the meter is connected to the line under test, do not touch the unused input terminals.

●When the measured voltage exceeds the rms value of 60V DC or 30V AC, be careful to prevent electric shock.

●When measuring with a test lead, place your finger behind the protective ring of the test lead.

●Before changing the range, make sure that the test lead has left the circuit under test.

●For all DC functions, in order to avoid the risk of electric shock due to possible incorrect readings, please use the AC function first to confirm whether there is any AC voltage. Then, select a DC voltage range that is equal to or greater than the AC voltage

●Before performing resistance measurement or continuity test, the power supply of the circuit under test must be cut off, and all high-voltage capacitors in the circuit under test must be discharged.

●Do not measure resistance or conduct continuity tests on live circuits.

●Do not put it in an explosive and flammable place when not in use.

●When repairing TV sets or measuring power conversion circuits, be careful of high-amplitude voltage pulses in the circuit under test to avoid damage to the meter.

●This product uses 3.7V/1000mA lithium battery for power supply, and the battery must be correctly installed in the battery box of the instrument.
●When the battery undervoltage symbol appears, please charge it in time. A low battery can cause the meter to read incorrectly, which could result in electric shock or personal injury.
●In the measurement category, the voltage measurement should not exceed 1000V.
●Do not use the instrument when the protective case (or part of it) is removed.

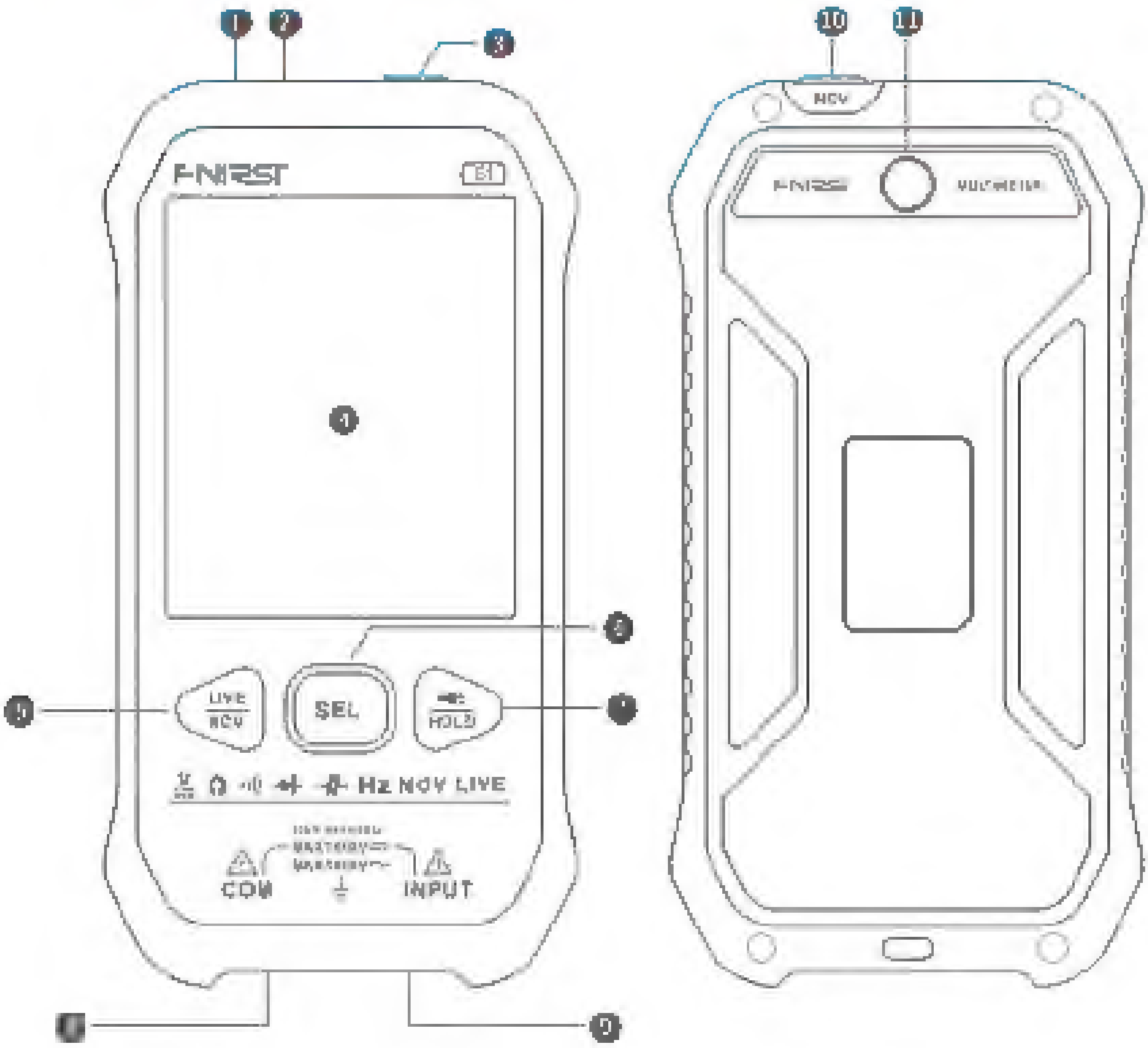
## 2. SAFETY MAINTENANCE HABITS

●When opening the case of the instrument or removing the battery cover, the test lead should be pulled out first.
●When repairing the instrument, be sure to use the designated replacement parts.
●Before turning on the instrument, you must disconnect all related power sources, and you must also ensure that you do not have static electricity to prevent damage to the components of the instrument.
●For accurate and correct calibration or maintenance of the instrument, you should return it to the factory.
●When opening the case of the meter, it must be noted that some capacitors in the meter still hold dangerous voltages even after the meter is powered off.
●If any abnormality is observed in the instrument, the instrument should be stopped immediately and sent for repair. And make sure that it cannot be used until it passes the inspection.
●When not in use for a long time, and avoid storing in places with high temperature and high humidity.

## 3. INPUT PROTECTION MEASURES

●When performing voltage measurements, the maximum input voltage that can withstand is 1000V, either DC or AC.
●Can withstand no more than 250V AC voltage or equivalent effective value voltage.

# 3.INSTRUMENT DESCRIPTION




❶ Charging port (5V-1A)
❷ Charging indicator (red light for charging, green light for full)
❸ On/Off Button
❹ LCD Monitor
❺ NCV and LIVE buttons
❻ SEL button
❼ Data hold and flashlight buttons
❽ black test pen input
❾ red test pen input
❿ NCV sensing area
⓫ flashlight

## BUTTON DESCRIPTION

| Button | Function Description |
|---|---|
| ⏻ | power button |
| SEL | Function switch button |
| HOLD | Data hold button and flashlight |
| LIVE / NCV | NCV function and Livewire function buttons |

# 4.OPERATION INSTRUCTIONS

## ①REGULAR OPERATION

Reading Hold Mode keeps the current reading on the display. The reading hold mode can be exited by changing the measurement function gear or pressing the key again. To enter and exit reading hold mode:

1. Short press the" HOLD "key,the reading will be held and the symbol will be displayed on the LCD HOLD display at the same time.

2. Short press the " HOLD " key again to restore the meter to the normal measurement state.

3. Long press " HOLD " to turn on the flashlight, and then long press to turn off the flashlight.

4. Press the " LIVE/NCV " key to perform NCV measurement. Press the " LIVE/NCV " key again to enter the live wire (LIVE) measurement.

## ②AUTOMATIC MEASUREMENT

**NOTE**

- Do not measure any voltage higher than 1000V DC/1000V AC to prevent electric shock or damage to the instrument.
- Do not apply more than 1000V DC voltage/1000V AC voltage between the common terminal and the ground to avoid electric shock or damage to the instrument.

In automatic mode, AC and DC voltage, resistance and continuity can be automatically measured.

1. After power on, it will automatically switch to "AUTO" automatic measurement mode.
2. Connect the black test lead and the red test lead to the COM input jack and the INPUT input jack respectively.
3. Use the test pen to measure the voltage value, resistance value and short-circuit point of the circuit to be tested at both ends. (parallel to the circuit under test)
4. At this time, the liquid crystal display will display the corresponding measured voltage value and resistance value at the same time. When measuring DC voltage, the display will show the voltage polarity connected to the red test lead at the same time. If the measured resistance value is less than 50Ω, the buzzer will issue an alarm sound.

**NOTICE**

When the measured DC voltage is less than 0.75V and the AC voltage is less than 0.75V, the displayed resistance value may appear, because the minimum measurement voltage value of this product is 0.75V, and the minimum AC voltage is 0.75V.

1. When measuring low resistance, in order to measure accurately, please first short-circuit the two test leads to read the short-circuit resistance value of the test leads, and subtract the resistance value after measuring the measured resistance.

2. In the 10M range, it will take a few seconds for the reading to stabilize. This is normal for high resistance measurements.
3. When the meter is open circuit or the resistance value of the measured object is too large, the display will display "OL", indicating that the measured value exceeds the range

## ③NCV TEST

Press the LIVE/NCV key ,place the top of the meter close to the conductor, if the meter detects AC voltage, the meter will The signal strength of , when the sensed voltage is low , the screen signal will display low: IIII , medium: IIIIIIII , high: IIIIIIIIIIIII , and at the same time the buzzer emits alarm sounds of different frequencies.

### ⚠ NOTICE

●Even without indication, voltage may still be present. Do not rely on non-contact voltage detectors to determine lead
Whether there is voltage on the line. Probing operations may vary by socket design, insulation thickness and type, etc.
influence of factors.
●When the input terminal of the meter enters the voltage, the buzzer will also sound due to the existence of the induced voltage.
sound.
●Interference sources in the external environment (such as flashlights, etc.) may falsely trigger the non-contact voltage detection.

## FIREWIRE TEST

Short Press $\frac{LIVE}{NCV}$, press the button twice, the screen displays LIVE, insert the red test pen into the INPUT end, and the red pen into the power socket, the meter displays LIVE, which is the live wire.

## DIODE MEASUREMENT

1. After power on, it will automatically switch to the "AUTO" automatic measurement mode, and then press the SEL key to switch to the " •))) ▶| " diode measurement mode.
2. Connect the black test lead and the red test lead to the COM input jack and the INPUT input jack respectively.
3. Connect the black test lead and the red test lead to both ends of the object to be tested.
4. If the measured object is a diode, the red and black test leads should be placed on the positive and negative ends of the diode respectively, and the meter will display the positive bias value of the tested diode. If the polarity of the test leads is reversed or the test points are connected, the polarity of the tubes is reversed, the meter will display "OL". In the circuit, a normal diode should produce a forward voltage drop of 0.5V to 0.8V, but the reading of the reverse bias voltage will depend on the change in the resistance value of the other channels between the two test leads.

## CAPACITANCE MEASUREMENT

1. After power on, it will automatically switch to the "AUTO" automatic measurement mode, and then press the SEL button to switch to the capacitance measurement mode.
2. Connect the black test lead and the red test lead to the COM input jack and the INPUT input jack respectively.
3. Use a test lead to measure the capacitance value of the capacitor to be measured at both ends and read the measured value from the LCD.

**NOTE**

- When measuring large capacitances, it will take some time for the reading to stabilize.
- When measuring polarized capacitors, pay attention to the corresponding polarity to avoid damage to the meter.

## FREQUENCY MEASUREMENT

1. After power on, it will automatically switch to the "AUTO" automatic measurement mode, and then press the SEL key to switch to the frequency Hz measurement mode.
2. Connect the black test lead and the red test lead to the COM input jack and the INPUT input jack respectively.
3. Use both ends of the test pen to read the measured value from the LCD display.

## TEMPERATURE MEASUREMENT

1. After power on, it will automatically switch to the "AUTO" automatic measurement mode, and then press the SEL key to switch to the measurement mode.
2. Connect the black input terminal of the thermocouple and the red test lead to the COM input jack and the INPUT input jack respectively. Fahrenheit is displayed along with the temperature value.
3. The LCD display reads the measured value.

**If there is inductive impedance in the line, there will be flutuations affecting the results read and the data maybe inaccurate. It is necessary to disconnect the test, and the correct test data will be obtained.**

# TECHNICAL INDICATORS

## COMPREHENSIVE INDICATORS

- 1000V CAT II, pollution degree: 2
- Altitude < 2000 m
- Working environment temperature and humidity: 0-40 °C (<80% RH, not considered when <10 °C)
- Storage environment temperature and humidity: -10-60 °C (<70% RH, remove the battery)
- Temperature coefficient: 0.1 × accuracy/°C (<18°C or >28°C)
- Maximum allowable voltage between measuring terminal and earth: 1000V DC or 1000V AC RMS
- Conversion rate: about 3 times / second
- Display: LCD display with a maximum of 9999 counts, which is automatically displayed according to the measurement function unit symbol
- Overrange indication: LCD will display "OL"
- Battery low voltage indication: When the battery voltage is lower than the normal working voltage, will be displayed
- Indication of input polarity: " " is displayed automatically
- Power supply: rechargeable lithium battery 3.7V 1000mA. Note: The device is not available in the power on state, and the display "[illegible]" at this time, unplug the charger and automatically switch to the normal measurement mode
- Dimensions: 143mm*75mm*19mm
- Weight: about 130g (including battery)

## ACCURACY INDEX

**Accuracy**: ±(reading + word), the warranty period is one year from the date of delivery

**Baseline conditions**: ambient temperature 18°C to 28°C, relative humidity not greater than 80%.

## 2.1 DC VOLTAGE

| Range<br>(excluding maximum value) | Resolution | Accuracy |
|---|---|---|
| 0-10V | 0.001V | ±(0.8% reading + 3 digits) |
| 10-100V | 0.01V | ±(0.8% reading + 3 digits) |
| 100-1000V | 0.1V | ±(0.8% reading + 3 digits) |
| 1000V | 1V | ±(1.2% reading + 3 digits) |

**Maximum input voltage:** 1000V DC RMS

**Minimum measurement voltage:** 0.5VDC

**Press the SEL button to switch the auto range mode in the smart mode**

## 2.2 AC VOLTAGE

| Range<br>(excluding maximum value) | Resolution | Accuracy |
|---|---|---|
| 0-10V | 0.001V | ±(0.8% reading + 3 digits) |
| 10-100V | 0.01V | ±(0.8% reading + 3 digits) |
| 100-1000V | 0.1V | ±(0.8% reading + 3 digits) |
| 1000V | 1V | ±(1.2% reading + 3 digits) |

**Maximum input voltage:** 1000V DC RMS

**Minimum measurement voltage:** 0.75VDC

**Frequency response:** 50HZ-1KHZ true RMS

**Press the SEL button to switch the auto range mode in the smart mode**

## 2.3 RESISTANCE

| Range<br>Excluding [illegible] value | Resolution | Accuracy |
|---|---|---|
| 0-1000Ω | 0.1Ω | ±(0.8% reading + 3 digits) |
| 1k-100kΩ | 0.01kΩ | ±(0.8% reading + 3 digits) |
| 100k-1000kΩ | 0.1kΩ | ±(0.8% reading + 3 digits) |
| 1M-100MΩ | 0.01MΩ | ±(1.2% reading + 3 digits) |

**Overload protection:** 250V DC, AC

## 2.4 BEEP ON AND OFF

| Function | Range | Resolution | Test Conditions | |
|---|---|---|---|---|
| •))) | 100Ω | 0.1Ω | Resistance not greater than 50Ω Built-in buzzer sounds continuously | Open circuit voltage About 0.4v |

**Overload protection:** 250V DC, AC

## 2.5 TEMPERATURE

| Range | Resolution | Accuracy |
|---|---|---|
| 20°C-0°C | 1°C | ±(5.0% reading + 4 digits) |
| 1°C-400°C | 1°C | ±(1.0% reading + 3 digits) |
| 401°C-1000°C | 1°C | ±(2.0% reading + 5 digits) |
| -4°F-32°F | 1°F | ±(5.0% reading + 8 digits) |
| 33.8°F-752°F | 1°F | ±(1.0% reading + 6 digits) |
| 753.8°F-1832°F | 1°F | ±(2.0% reading + 10 digits) |

## 2.6 CAPACITANCE

| Range (excluding maximum value) | Resolution | Accuracy |
|---|---|---|
| 0-10nF | 0.001nF | ±(4.5% reading + 5digits) |
| 10-100nF | 0.01nF | |
| 100-1000nF | 0.1nF | |
| 1μ-10μF | 0.001μF | |
| 10μ-100μF | 0.01μF | |
| 100μ-1000μF | 0.1μF | |
| 1m-10mF | 0.001mF | |

**Overload protection:** 250V DC/AC

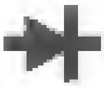
## 2.7 FREQUENCY

| Range (excluding maximum value) | Resolution | Accuracy |
|---|---|---|
| 0-10Hz | 0.001Hz | ±(0.1% reading + 3digits) |
| 10-100Hz | 0.01Hz | |
| 100-1000Hz | 0.1Hz | |
| 1k-10kHz | 0.001kHz | |
| 10k-100kHz | 0.01kHz | |
| 100k-1000kHz | 0.1kHz | |
| 1000kHz-10MHz | 1kHz | |

**Input Sensitivity:** 1.5V RMS

**Overload Protection:** 250V DC or AC Peak(no more than 10 seconds) frequency measurement

### 2.8 DIODES

| Function | Resolution | Test Conditions |
|---|---|---|
|  | 0.001V | Forward DC current: about 1mA<br>Open circuit voltage: about 3.2V<br>monitor display diode<br>Approximate value of forward voltage drop |

**Overload protection:** 250V DC/AC

## 6.INSTRUMENT MAINTENANCE

●Regularly clean the meter case with a damp cloth and a small amount of detergent, do not use abrasives or chemical solvents.

●Dirty or wet input jacks may affect readings.

●To clean input jacks:

1. Turn off the meter and unplug all test leads from the input jacks.
2. Remove all dirt from the jack.
3. Use a new cotton ball dipped in detergent or lubricant to clean each socket, the lubricant can prevent and moisture related jack contamination.

## 7.CONTACT US

**Any FNIRSI'users with anyquestions who comes to contact us will have our promise to get asatisfactory solution + an Extra 6-Month Warranty to thanks for yoursupport!**

**By the way, We have created an interesting community, welcome to contact FNIRSI staff to join our community.**


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